

MATERIAL SAFETY DATA SHEET

SRM Supplier: National Institute of Standards and Technology
Standard Reference Materials Program
Bldg. 202 RM 211
Gaithersburg, Maryland 20899

SRM Number: 1635
MSDS Number: 1635
SRM Name: Trace Elements in Coal
(Subbituminous)
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SECTION I. MATERIAL IDENTIFICATION

Material Name: Trace Elements in Coal (Subbituminous)

Description: Coal is formed naturally from fossilized plants, consisting of amorphous carbon with various organic and inorganic compounds. The compounds form conjugated polyaromatic, polyunsaturated, and polysaturated ring structures with heterocycles containing oxygen, nitrogen, and sulfur.

This SRM consists of subbituminous coal that was sieved through a nominal sieve opening of 230 μm (No. 65) and then blended to assure homogeneity.

Other Designations: Coal Dust (subbituminous coal, ground subbituminous coal), constituents in Subbituminous Coal

Chemical Formula: $\text{C}_{102}\text{H}_{78}\text{O}_{10}\text{N}_2$ (suggested as a coal molecule)

CAS Registration Number: N/A

DOT Classification: Not regulated by DOT

Manufacturer/Supplier: Available from a number of suppliers

SECTION II. HAZARDOUS INGREDIENTS

Hazardous Component	Nominal Concentration (%)	Exposure Limits and Toxicity Data
Coal Dust (~ 3 % SiO_2)	~ 100	OSHA PEL-TWA: 2 mg/m^3 (respirable quartz fraction with < 5 % SiO_2)
		OSHA PEL-TWA: 0.1 mg/m^3 (respirable quartz fraction with > 5 % SiO_2)
		ACGIH TLV-TWA: 2 mg/m^3 (respirable dust fraction with < 5 % SiO_2)

SECTION III. PHYSICAL/CHEMICAL CHARACTERISTICS

Subbituminous Coal
Appearance and Odor: a black powder with little or no odor
Specific Gravity: 1.2 – 1.7
Vapor Pressure (at 25 °C): negligible
Water Solubility: negligible

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: N/A**Method Used:** N/A**Autoignition Temperature:** > 601 °C (cloud)
> 200 °C (layer)**Flammability Limits in Air (Volume %):** **UPPER:** None reported
LOWER: > 50 g/m³ (0.05 oz/ft³)**Extinguishing Media:** For small fires, use dry chemical, sand, earth, water spray, or regular foam. Use water spray, fog, or regular foam for large fires involving coal dust.**Unusual Fire and Explosion Hazards:** This material is a fire hazard when exposed to heat or flames. Airborne coal dust is an explosion hazard.**Special Fire Procedures:** Since the fire may produce toxic fumes, firefighters should wear self-contained breathing apparatus and full protective clothing.

SECTION V. REACTIVITY DATA

Stability: X Stable Unstable**Conditions to Avoid:** Avoid heat, flames, and sources of ignition.**Incompatibility (Materials to Avoid):** Keep this material from strong oxidizing agents.**Hazardous Decomposition or Byproducts:** Thermal oxidative decomposition of coal dust can include oxides of carbon, nitrogen, and sulfur, as well as partially oxidized hydrocarbons, soot, and fly ash.**Hazardous Polymerization:** Will Occur X Will Not Occur

SECTION VI. HEALTH HAZARD DATA

Route of Entry: X Inhalation Skin Ingestion**Health Hazards (Acute and Chronic):** Exposure to coal dust can occur through inhalation, ingestion, and eye contact. Dust may cause minimal irritation to the eyes and respiratory tract. Prolonged and repeated contact to dust may cause skin irritation. Coal workers' pneumoconiosis is the occupational disease caused by prolonged retention of abnormal amounts of dusts in the lungs. It can occur after years of excessive exposure to respirable coal dust in coal mining, handling, and processing. Workers with rheumatoid arthritis and the simple coal workers' pneumoconiosis may also have Caplan's Syndrome which involves rapidly developing lung damage.**Signs and Symptoms of Exposure:** Coughing, wheezing, and shortness of breath. Long term effects include chronic bronchitis and emphysema.**Medical Conditions Generally Aggravated by Exposure:** Any individual with a chronic pulmonary disorder should protect against exposure to coal dust.**Listed as a Carcinogen/Potential Carcinogen:**

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens	<u> </u>	<u> X </u>
In the International Agency for Research on Cancer (IARC) Monograph	<u> </u>	<u> X </u>
By the Occupational Safety and Health Administration (OSHA)	<u> </u>	<u> X </u>

EMERGENCY AND FIRST AID PROCEDURES:**Skin Contact:** Remove contaminated shoes and clothing. Wash affected area well with soap and water. Obtain medical assistance if necessary.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Obtain medical assistance.

Inhalation: If inhaled, move the victim to fresh air. If breathing is difficult, give oxygen; if the victim is not breathing, give artificial respiration. Obtain medical assistance if necessary.

Ingestion: If ingestion occurs, wash out mouth with water. **DO NOT** induce vomiting. Obtain medical assistance immediately.

TARGET ORGAN(S) OF ATTACK: lungs

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken in Case Material is Released: Notify safety personnel of leaks and spills. Remove sources of heat or ignition and provide adequate ventilation. Personnel performing the clean-up should use protection against inhalation. Clean up coal dust in a manner that avoids dispersing particulates into the air or environment. A water spray may be used to cautiously wet down coal dust to avoid raising dust. Use nonsparking tools to collect dust and place in a covered metal container for reclamation or for disposal.

Waste Disposal: Follow all federal, state, and local regulations.

Handling and Storage: Provide adequate ventilation where operating conditions (heating and spraying) may create excessive vapors and mists. Use explosion proof equipment. Provide approved respiratory apparatus for non-routine or emergency use where ambient concentrations of coal dust exceed prescribed exposure limits. Workers should use appropriate personal protective clothing and equipment that is carefully selected, used, and maintained to be effective in preventing skin and eye contact with coal dust. The selection of the appropriate personal protective equipment should be based on the extent of the workers' potential exposure to coal dust. An eye wash station and washing facilities should be readily available near handling and use areas.

NOTE: Contact lenses pose a special problem; soft lenses may absorb irritants and all lenses concentrate them. **DO NOT** wear contact lenses in the laboratory.

Store material in closed containers in a cool, dry, well ventilated area away from sources of heat, sparks, open flames, and oxidizing agents. Protect containers from physical damage.

SECTION VIII. SOURCE DATA/OTHER COMMENTS

Sources: Occupational Safety and Health Guidelines for Coal Dust (Less than 5 % SiO₂)
<http://www.osha-slc.gov/SLTC/healthguidelines/coal-dust-less5percent-sio2/index.html>. Revision Date: 10 June 1998.

Disclaimer: Physical and chemical data contained in this MSDS are provided only for use in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data on the MSDS. The certified values for this material are given on the NIST Certificate of Analysis.